

## MARISA L. TREGO

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### RESEARCH INTERESTS

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My primary research interests involve the use of molecular biology to answer conservation-focused questions. In particular, those that aid in the study and management of wild marine mammal populations. My current research integrates transcriptome, hormone, and contaminant analysis to elucidate the mechanistic relationship between contaminant exposure and health effects. I intend to develop this into a management tool that will transform how health is assessed in free-ranging cetaceans and to continue conducting cutting edge research on how contaminants affect resilience and survival of wildlife populations.

### EDUCATION

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**PhD Candidate: Ecology** – University of California, Davis/San Diego State University ▪ 2012- Present

- GPA – 3.9, Area of Emphasis: Ecotoxicology

**B.S. Evolution, Behavior, and Ecology** – University of California, San Diego ▪ 2001- 2005

- GPA – 3.5, Provost's honors
- *Education Abroad*: Marine Biology & Tropical Ecology – James Cook University, Australia ▪ 2003

### PROFESSIONAL EXPERIENCE

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**Hormone Analyst** – NOAA, Southwest Fisheries Science Center, La Jolla, CA ▪ Sept 2012 – Present

- Provide technical expertise on marine mammal endocrine research
- Manage data for the Marine Mammal Wildlife Endocrine Laboratory
- Coordinate and implement novel protocols for marine mammal health assessment research
- Analytical consultant and report coordinator for dolphin endocrine data during phase two of the Deepwater Horizon Oil Spill marine mammal damage assessment

**Project Manager & Researcher** – NOAA, Southwest Fisheries Science Center, La Jolla, CA ▪ Sept 2009 – Aug 2012

- Develop and validate novel molecular markers for health in free-ranging marine mammal populations
- Manage and implement research in the Marine Mammal Wildlife Endocrine Laboratory
- Provide technical training for technicians, volunteers, and international visiting scientists
- Contribute to and write scientific publications
- Project manager and technical specialist of the production and compilation of lipid-based endocrine data for phase one of the Deepwater Horizon Oil Spill marine mammal damage assessment

**Marine Ecology Researcher** – NOAA, Southwest Fisheries Science Center, La Jolla, CA ▪ Jan 2006 – Aug 2009

- Conduct research estimating the vital rate of dolphin stocks, including those associated with the Eastern Tropical Pacific tuna fishery
- Produce and analyze data for all lipid-based marine mammal endocrine research

- Assist with fieldwork by taking biopsies, taking photographs, handling samples, respond to mammal strandings, and perform land-based visual surveys
- Create and manage databases for all marine mammal endocrine operations in Access
- Contribute to and write scientific publications

**Lab Technician** – NOAA, Southwest Fisheries Science Center, La Jolla, CA ▪ Feb 2003 – Dec 2005

- Process data for studies examining cetacean population genetics, endocrinology, taxonomy, and histology
- Assist in validating novel molecular techniques for pregnancy diagnosis in free-ranging marine mammals

**Lab Assistant** – Scripps Institution of Oceanography, La Jolla, CA ▪ Sept 2002 – Feb 2003

- Performed DNA extractions, gel electrophoresis, and basic lab duties
- Prepared and maintained hybrid copepod populations

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## PUBLICATIONS

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- Kellar, N. M., Catelani, K. N., Robbins, M. N., Allen, C. D., **Trego, M. L.**, Danil, K., Chivers, S. J. (2015) Blubber cortisol: A potential tool for assessing stress response in free-ranging dolphins without effects due to sampling. PLoS ONE. DOI:10.1371/journal.pone.0115257
- Kellar, N. M., **Trego, M. L.**, Chivers, S. J., Danil, K., Archer, F. I., and Perryman, W. L. (2014) From progesterone in biopsies to estimates of pregnancy rates: Large scale reproductive patterns of two sympatric species of common dolphin, *Delphinus* spp. off California, USA and Baja, Mexico. Bulletin of the Southern California Academy of Sciences: 113(2). <http://scholar.oxy.edu/scas/vol113/iss2/2>
- Kellar, N. M., Keliher, J., **Trego, M. L.**, Catelani, K. N., Hanns, C., and George, C., Rosa, C. (2013) Progesterone concentrations relative to bowhead whale life-history state in three sampled matrices. Endangered Species Research 22: 61-72.
- **Trego, M. L.**, Kellar, N. M., and Danil, K. (2013) Validation of blubber progesterone concentrations for pregnancy determination in three dolphin species and a porpoise. PLoS ONE 8(7): e69709. doi: 10.1371/journal.pone.0069709
- Kellar, N. M., **Trego, M. L.**, Chivers, S. J., and Archer, F. I. (2013) Pregnancy patterns of pantropical spotted dolphins (*Stenella attenuata*) in the eastern tropical Pacific determined from hormonal analysis of blubber biopsies and correlations with the purse-seine tuna fishery. Marine Biology:1-12.
- Kellar, N. M., **Trego, M. L.**, Chivers, S. J., Archer, F. I., Minich, J. J., and Perryman, W. L. (2013) Are there biases in biopsy sampling? Potential drivers of sex ratio in projectile biopsy samples from two small delphinids. Marine Mammal Science. doi: 10.1111/mms.12014
- Kellar, N. M., **Trego, M. L.**, Marks, C. I., Chivers, S. J., Danil, K., and Archer, F. I. (2009) Blubber testosterone: a potential marker of male reproductive status in short-beaked common dolphins. Marine Mammal Science 25: 507-522.
- Kellar, N. M., **Trego, M. L.**, Chivers, S. J., and Archer, F. I. (2008) Histological patterns of dolphin corpus luteum growth and development: finding characters to differentiate CLs of ovulation from those of pregnancy. In Marine Biology (University of California, San Diego, La Jolla), p. 35.
- Kellar, N. M., **Trego, M. L.**, Marks, C. I., and Dizon, A. E. (2006) Determining pregnancy from blubber in three species of delphinids. Marine Mammal Science 22:1-16

## PRESENTATIONS & POSTERS

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- \* Environmental Toxicology and Genetics. **Guest Lecture** in Genetics and Society, undergraduate course at UC Davis.
- **Trego, M. L.**, Hoh, E., Dodder, N. G., Catelani, K. N., Allen, C. D., Kellar, N. M., and Lewison R. L. (2013) Comprehensive assessment of contaminant exposure in *Delphinus delphis* from the Southern California Bight. **Poster** at the 20<sup>th</sup> Biennial Marine Mammal Conference, Dunedin, New Zealand.
- \* **Trego, M. L.** and Kellar, N. M. (2013) Blubbering Hormones: A novel approach to marine mammal health assessment. **Seminar** at SDSUs Costal Marine Institute Laboratory, San Diego, CA.
- **Trego, M. L.**, Kellar, N. M., and Danil, K. (2010) A comparison of progesterone in the blubber of female delphinoides: *Delphinus capensis*, *Stenella attenuata*, *Stenella longirostris*, and *Phocoenoides dalli*. **Poster** at the 2<sup>nd</sup> Annual Southern California Marine Mammal Workshop, Long Beach, CA.
- **Trego, M. L.**, Kellar, N. M., and Danil, K. (2007) A comparison of progesterone in the blubber of female delphinoides: *Delphinus capensis*, *Stenella attenuata*, *Stenella longirostris*, and *Phocoenoides dalli*. **Talk** at the 17<sup>th</sup> Biennial Marine Mammal Conference, Cape Town, South Africa.
- **Trego, M.L.**, Keating, J.L., Yack, T.M., and Bowles, A.E. (2005) Localization of calling killer whales (*Orcinus orca*) using a hydrophone array in a reverberant environment. **Poster** presented at the 16<sup>th</sup> Biennial Marine Mammal Conference, San Diego, CA.

\* **Invited**

## AWARDS, SOCIETIES, & SERVICE

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### Grants and Awards:

1 <sup>st</sup> Place Poster Presentation –NorCal SETAC Annual Meeting ▪ \$150	2015
Student Research Grant – Southern California SETAC ▪ \$1,500	2014
Honorable Mention – National Science Foundation GRFP	2012 & 2014

### Society Memberships:

Society for Marine Mammalogy	2005 – present
National Society of Collegiate Scholars	2003 – present
Ecological Society of America	2014
Society of Environmental Toxicology and Chemistry	2014
Western Society of Naturalists	2014

### Committee Involvement:

Joint Doctoral Program in Ecology Student Committee, founding member	2014 – present
UC Davis Ecology Graduate Student Association	2014 – present

### Workshops/Meetings:

Planning Committee Volunteer, UC Davis Graduate Student Symposium in Ecology	2015
Networking Coordinator, Student Affairs Workshop, 16 <sup>th</sup> Biennial Marine Mammal Conference, San Diego, CA	2005

**Journal Reviews:** Reviewer for PLoS ONE, Polar Biology, Mammal Review

## MENTORSHIP & OUTREACH

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- Trained incoming technicians in the laboratory at Southwest Fisheries Science Center
  - *Jenifer Keliher-Venegas* – SDSU undergraduate student intern ▪ 2009 – 2012
  - *Krista Catelani* – Laboratory technician ▪ 2011 – 2012
- Led week-long one-on-one laboratory trainings for visiting scientists

**Outreach Volunteer** – Picnic Day Outreach Event, University of California, Davis, CA ▪ April 2014

- Educated the public on current environmental toxicology research at UCD

**Outreach Volunteer** – Coastal Marine Institute Laboratory Open House ▪ April 2012

- Organized and operated a NOAA outreach table to inform the public of SDSU student research activities at Southwest Fisheries Science Center
- Coordinated interactive events for visitors to offer an inside view of NOAA field research

## VOLUNTEER EXPERIENCE

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**IACUC Coordinator** – Southwest Fisheries Science Center, La Jolla, CA ▪ April 2010 – Dec 2011

- Facilitate the review of research and record meeting minutes for the regional IACUC committee

**Acoustics Intern** – Hubbs Sea World Research Institute, San Diego, CA ▪ Jan – June 2005

- Tested a method to acoustically localize killer whales at Sea World using sound exposure level in an array of hydrophones

**Sea Turtle Conservation Intern** – International Student Volunteers, Costa Rica ▪ Aug 2003

- Contributed to sea turtle conservation by patrolling the beach for poachers, monitoring nesting females, and accounting for hatcheries

## LABORATORY & COMPUTER SKILLS

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### **Biochemical and Genetic Methods:**

Steroid Isolation

Enzyme Immunoassay (EIA) and ELISA

DNeasy DNA extraction

Sodium Chloride DNA extraction

Polymerase Chain Reaction (PCR)

Quantitative PCR (QPCR)

QIAquick PCR purification

Gel electrophoresis

Sequencing

Amplified Fragment Length Polymorphism

Gel Permeation Chromatography

### **Instruments:**

Corbett extraction robot

Tecan Sunrise & Genios Microplate Readers

Applied Biosystems DNA Analyzers

PerkinElmer automated workstation

Dionex Accelerated Solvent Extractor

Agilent 2100 Bioanalyzer

Omni BeadRuptor 24

NanoDrop

### **Programs:**

R Programming Language

Microsoft Access & Excel

Magellan - Tecan Data Analysis Software

MxPro - QPCR Software

Sequencher - DNA Sequencing Software

GeneMapper - ABI Genotyping Software

## TRAINING AND CERTIFICATIONS

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**Boating Skills and Seamanship** – US Coast Guard Auxiliary, San Diego, CA ▪ Sept – Nov 2010

- The fundamental rules and regulations of the sea, safety concerns, and skilled boating practices

**Introduction to Aquatic Toxicology: Understanding Impacts of Organic Chemicals and Metals on Aquatic Ecosystems** – Northwest Environmental Training Center, San Diego, CA ▪ June 18-19, 2009

- The foundations of toxicology, toxicity assessment, and fate of contaminants in the environmental